

Sample Test Paper
EC: Electronics and Communication

Duration : 20 Min.

Maximum Marks :16

Q.1–4 carry one mark each

1. The Boolean Expression : $\overline{B \oplus E}$ is a simplified version of expression :
 $\overline{ABE} + BCDE + \overline{BCDE} + \overline{ABDE} + \overline{BCDE} + \overline{ABDE}$
then which of the following choice is correct :

- (i) don't care conditions don't exist
(ii) don't care conditions exist
(iii) d (16, 18, 20, 23, 27, 29) is the set of don't care conditions
(iv) d (16, 20, 22, 27, 29) is the set of don't care conditions

Choices :

- (A) i only (B) ii and iii only
(C) ii and iv only (D) Data insufficient.

2. The matrix e^{At} is given as $\begin{bmatrix} e^{-2t} & 0 \\ -\frac{1}{2}e^{-2t} + \frac{1}{2}e^{-4t} & e^{-4t} \end{bmatrix}$ the value of state matrix 'A' is given

by __

- (A) $\begin{bmatrix} -2 & -1 \\ 0 & -4 \end{bmatrix}$ (B) $\begin{bmatrix} 2 & 1 \\ 0 & 4 \end{bmatrix}$
(C) $\begin{bmatrix} -2 & 0 \\ -1 & -4 \end{bmatrix}$ (D) $\begin{bmatrix} -2 & 0 \\ -1 & 4 \end{bmatrix}$

3. An angle modulated signal is expressed as

$$s(t) = A_C \cos[\theta_i(t)]$$

The angular velocity of phasor s(t) is

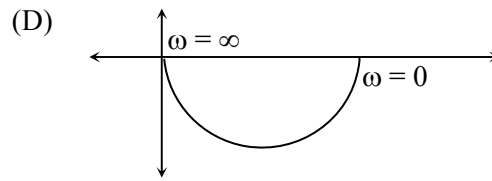
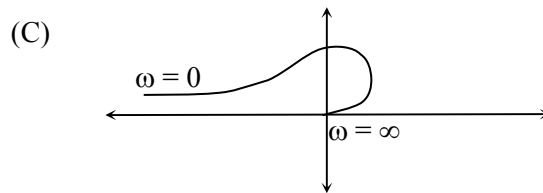
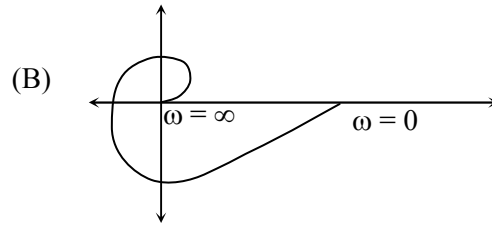
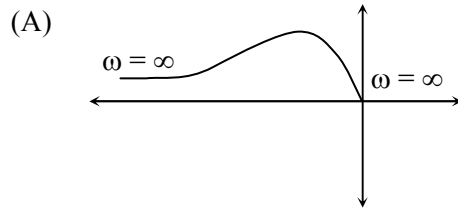
- (A) $\frac{d}{dt} \theta_i(t)$ (B) $\frac{d^2}{dt^2} \theta_i(t)$
(C) $\frac{\theta_i(t)}{t}$ (D) $\int_0^{2\pi} \theta_i(t) dt$

Getting into the I.I.T.s is your aim, taking you there is ours.

4. A system has a transfer function

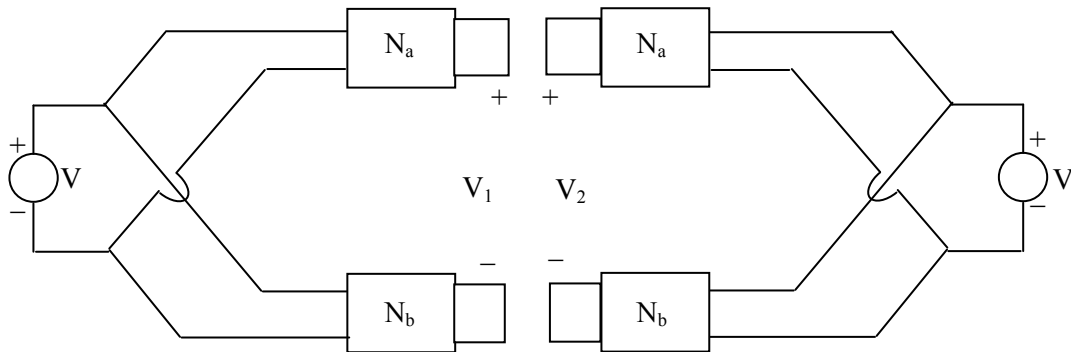
$$\frac{1}{s^2(1+sT_1)(1+sT_2)}$$

Its polar plot is



Q.5–10 carry two marks each

5. Consider the figure as shown



For the circuit shown above, the validity of constraint $Y = Y_a + Y_b$ will be satisfied if and only if

- (A) $V_1 > V_2$ (B) $V_1 < V_2$
 (C) $V_1 = V_2 = 0$ (D) $V_1 = V_2 \neq 0$

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8. What is the correct sequence of the following steps in the fabrication of a monolithic bipolar junction transistor.

- | | |
|---------------------------|--------------------------|
| 1. Emitter Junction | 2. Base diffusion |
| 3. Buried layer formation | 4. Epi layer termination |

- | | |
|----------------|----------------|
| (A) 3, 4, 1, 2 | (B) 4, 3, 1, 2 |
| (C) 3, 4, 2, 1 | (D) 4, 3, 2, 1 |

9. $\int_1^{\infty} \frac{dx}{e(\ln x)^p}$ is _____ for $p \geq 1$

- | | |
|-------------------------------------|-------------------|
| (A) convergent | (B) divergent |
| (C) convergent as well as divergent | (D) none of these |

10. The PDF of a Gaussian random variable X is given by $P_x(x) = \frac{1}{3\sqrt{2\pi}} e^{-\frac{(x-4)^2}{18}}$. The probability of the event $\{X = 4\}$ is

- | | |
|-------------------|------------------------------|
| (A) $\frac{1}{2}$ | (B) $\frac{1}{3\sqrt{2\pi}}$ |
| (C) 0 | (D) $\frac{1}{4}$ |



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